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ABSTRACT

This booklet describes the development and content of a model staff development pack for use in training teachers to incorporate the techniques of computer-based learning into their subject teaching. The guide consists of three parts. Part 1 outlines the aims and objectives, content, and use of the pack. Described next are seven curriculum samples dealing with the following subject areas: biology, business studies, catering science, construction, engineering, motor vehicle simulation, and theodolite simulation. Part 3 discusses the aims, development, field testing, and regional and institutional implications and impacts of the model. Appendixes to the booklet include lists of various persons involved in developing the packages, lists of regional Further Education Unit (FEU) regional curriculum bases and FEU local information centers in Great Britain from which the packs may be obtained, and a glossary. (MN)

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A Staff Development Publication

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COMPUTER BASED LEARNING IN FE

A staff development model

CE040826

FURTHER EDUCATION UNIT

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Press and Other Interested Institutions/ Individuals

Dear Sir/Madam

COMPUTER BASED LEARNING IN FE

Attached is a report which describes an FEU supported Regional project in a new area of staff development. The Introduction describes the nature of the processes and products that comprised the project. Section III of the document gives virtually a blow by blow account of how this complex enterprise was initiated, managed and brought to a successful conclusion. It is offered as a possible model of participative staff development, to LEAs and other RACs for their consideration and possible adaptation.

The tangible outcomes of the project comprise a staff development pack, described in Section I of this document; and a series of supporting curriculum exemplars, described in Section II of this document.

The packages are available at the lowest possible prices from a polytechnic publishing house*. The FEU has made inspection copies available to all its Local Information Centres (see Appendix F) and Regional Curriculum Bases (Appendix E).

Computer Based learning (CBL) remains something of a mystery to many FE teachers. This report describes how a region involved some two hundred teachers in coming to grips with the concept, how over sixty of them actively participated in producing courseware and how that material was tested. In describing the products and processes associated with this project, this document removes a little of the mystique and introduces readers to a source of greater clarification.

Yours faithfully

Jack Mansell

JACK MANSELL
Chief Officer

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INTRODUCTION

1. This document is based on work over two years by some two hundred teachers in Yorkshire and Humberside. The project was partly funded by the FEU, but with the involvement of so many staff, quite obviously the major contribution was the local dimension.

2. Even without a tangible output, the active involvement of so many teachers in planning, producing and evaluating computer based material, meant that for them at least it was a worthwhile staff development exercise. In fact, as the document shows, the project also resulted in a saleable product: a staff development pack with computer-based subject exemplars. An additional output is the description of a regionally supported staff development enterprise that can be used as a model for adaptation by other regions and/or local authorities.

3. Section I of the document describes the aims and objectives of the pack and how to use it. The pack is designed for FE teachers who wish to explore and utilise the power of Computer-based Learning (CBL) in their subject teaching; but it will obviously be of value to other teachers and trainers. The aims of the pack are concerned with increasing awareness of the potential of CBL and with developing the techniques of producing and evaluating CBL material. The pack comprises a Manager's Guide and ten modules which comprise support material such as lesson plans, overhead projector material and 'courseware' (ie software plus notes). These packs are to be available for viewing from FEU Local Information Centres and Regional Curriculum Bases; (see Appendix E). They can be purchased from PAVIC PRODUCTIONS, Sheffield City Polytechnic (see Section II).

4. Section II comprises descriptions of seven software exemplars, each related to a specific vocational area. The format of these descriptions is similar to that used in another FEU document *: Aims, Content, Target Population, Learning Objectives and Technical Data. These exemplars are meant to support the staff development pack outlined in Section I, although not all will be appropriate to all staff. Each exemplar is in the form of a package which consists of a computer program (on disk) and appropriate documentation including students notes.

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* Microcomputer materials from MEP (1984)

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5. Section III is mainly intended for those interested in the creation of staff development opportunities and networks, and in the role of local, regional and national bodies in supporting such a network. It outlines the background to the project and identifies its genesis as a three day regional conference in 1980. After a regional survey in 1981 to determine the current state of micro computing in the region, a project proposal was formulated and this was approved by the FEU in 1982. The section then goes on to describe the aims of the project, the way it was steered, launched and co-ordinated. It concludes with some general comments and conclusions, not least of which are those associated with the resource implications.

6. It is evident from Section III of the report that an enormous amount of work was taken on board; as enthusiasm for the project increased, so its co-ordination and control became more complex. Appreciation must here be recorded for Peter Shuker as Project Director, who with all his colleagues (shown in Appendix B) managed to bring such an ambitious exercise to a successful conclusion. They had throughout, the continued support of a steering committee (Appendix A) and of the Yorkshire and Humberside Association for Further and Higher Education.

7. Whether or not this regional model of initiative, development and dissemination is taken up by other RACs or local authorities, it is worth serious consideration. The materials will inevitably become dated but even in that context they provide a basis for further staff development. Regretfully the FEU has not the funds to replicate this exercise in other regions; neither can it fund any extension of this project except for initial, minimal support for dissemination of the materials produced. A model has been created and tested; this document disseminates that model. The DES Education Support Grants* give LEAs an opportunity to exploit the expertise developed in the model. In this project the focus was a computer-based learning need that will obviously continue, and in this respect this document and its commercially available material has an immediate utility. Other curricular demands will obviously arise, requiring as they will an extension of teacher skills. In this respect the collaboration developed throughout in this project should have a long-term relevance.

*Educational Support Grants. DES Circular 6/84: published 18 July 1984. Available from Publications Despatch Centre, DES, Honeypot Lane, Cannons Park, Stanmore HA7 1AZ

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SECTION I: THE STAFF DEVELOPMENT PACK

Main Aims and Objectives

8. The staff development pack is for teachers in further education who are primarily concerned with teaching with the AID of the computer as a classroom resource rather than teaching ABOUT computers as an object of study. The idea arose out of consideration of how COMPUTER BASED LEARNING (CBL) could be put into operation and spread more widely in FE throughout a region. In this context CBL is taken to cover any activity in the curriculum where a computer has the possibility of enhancing the learning process. It is hoped that the package will provide a vehicle for innovation, cross fertilisation of ideas and dissemination of techniques and programs within and across subject areas and FE institutions. It is further hoped that it will prove to be the most cost effective and educationally sound method of implementing this particular technological innovation.

9. The aims of staff development pack are to:

(i) increase the awareness of FE teachers of the implication of CBL for all aspects of the curriculum;

(ii) introduce FE teachers to the possible applications of CBL in their own and other subject areas;

(iii) establish standards to be adopted in the production and evaluation of CBL materials;

(iv) enable FE teachers to obtain CBL materials and evaluate them for use as a realistic option within their teaching strategy;

(v) develop expertise in CBL;

(vi) allow staff to generate ideas and initiatives in new courses and associated curriculum development;

(vii) allow staff to develop the existing curriculum in such a way as to integrate CBL where appropriate into course content and teaching methods.

10. Through proper use of the package FE teachers will be able to:-

(i) define computer-based learning;

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(ii) list various modes of application;

(iii) select relevant applications from within the modes, for use within their own subject areas;

(iv) discriminate between 'good' and 'bad' CBL programs/packages;

(v) apply CBL as an extension to and/or support for their teaching methods;

(vi) provide guidelines for course development based on sound knowledge of 'good' CBL standards, software and resources;

(vii) recognise where CBL can enhance learning and initiate changes in teaching methods and course control as appropriate;

(viii) implement and manage the innovation.

Module Aims and Objectives

The Staff Development package comprises ten modules:-

11. Module 1 - Rationale and Introduction

Aims: To set up and use a micro-computer system and suggest reasons for using Computer Based Learning in FE

Objectives: At the end of the module the course member will be able to:-

(i) define Computer Based Learning (CBL);

(ii) load and run programs on the BBC mode B and/or RML 380Z micro-computers;

(iii) connect up and use a

(a) cassette recorder (BBC)

(b) disc-drive

(c) printer

(iv) give reasons, supported by examples for using CBL in FE;

(v) recognise attitudes and attitude changes to CBL in FE.

Associated Software: the BBC Welcome or similar demonstration programs. (see Figure 1)

12. Module 2 - Functions and Limitations

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Aims: To remove the mystique associated with computers and computing by gaining an awareness of the functions and limitations of the computer.

Objectives: At the end of the module the course member will be able to:

(i) list and refute some of the myths associated with the computer;
(ii) list some of the characteristics common to all computers;
(iii) define a computer in terms of its functions;
(iv) relate applications to functions and give possible examples of each application in FE.

Associated Software: Logic network and fault-finding programs. (See Figure 1.)

13. Module 3 - Basic Features of the Computer

Aim: To become familiar with the basic features of the computer.

Objectives: At the end of the module the course member will be able to:-

(i) list the similarities between the micro-computer system and the office;
(ii) list various types of INPUT and OUTPUT;
(iii) define the micro-computer system in terms of its processing function.

Associated Software: training aid and simulation (See Figure 1).

14. Module 4 - Computer Assisted Learning

Aims: To outline WHAT Computer Assisted Learning (CAL) is and HOW, WHEN and WHERE it can be used to enhance the teaching/learning situation.

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Objectives: At the end of the module the course member will be able to:-

(i) define CAL in the context of CBL;

(ii) classify various types of CAL according to:

(a) level of interaction

(b) type of application

(c) method of presentation

(iii) give examples from his/her own specialist area where CAL could possibly be used to good effect and classify these according to (ii) above:

(iv) appreciate the potential of CAL by using monitoring and data capture techniques to convert complex data to comprehensive information.

Associated Software: excerpts from several of the curriculum exemplars (See Figure 1).

15. Module 5 - The Production of CAL Materials

Aim: To become familiar with the strategies and techniques involved in designing CAL materials

Objectives: At the end of the module the course member will be able to:-

(i) relate some of the principles of learning to the creation of instructional materials;

(ii) show how these principles can be used in the design of CAL materials;

(iii) list four methods of producing CAL materials;

(iv) outline the stages involved in the design, development and evaluation of CAL materials;

(v) list some of the characteristics of 'good' instructional materials;

(vi) suggest methods to be used to ensure these characteristics are integrated into CAL materials;

(vii) design a small segment of a CAL lesson;

(viii) create the above using one of the four means outlined in (iii).

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Associated Software: interactive program 'drawing a picture'. (See Figure 1).

16. Module 6 - Computer Managed Learning

Aims: To increase the awareness of the course members to the implications of Computer Managed Learning (CML) for all aspects of the curriculum and to introduce them to the possible applications of CML to their own and other subject areas.

Objectives: At the end of the module the course member will be able to:-

(i) define Computer Managed Learning (CML) in the context of CBL;
(ii) list various modes of application;
(iii) recognise HOW and WHERE CML can enhance the teaching/learning situation within his/her own subject area;
(iv) list possible outcomes from a CML program;
(v) load and run a CML system;
(vi) create a simple multi-choice test to be analysed by a CML system.

Associated Software: Catering Science package and other project exemplars. (see Figure 1)

17. Module 7 - Computer Assisted Administration

Aim: To become aware of the potential of a micro-computer system as an aid to ACADEMIC ADMINISTRATION

Objectives: At the end of the module the course member will be able to:-

(i) define ACADEMIC ADMINISTRATION;
(ii) define Computer Assisted Administration (CAA) in the context of CBL;
(iii) load, run and use various CAA programs;
(iv) list advantages and shortcomings of these and similar programs.

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Associated Software: data-base business studies package. (see Figure 1)

18. Module 8 - Curriculum Development Packages within FE

Aim: To provide information relating to quality, quantity and sources of available programs, listed according to subject area.

Objectives: At the end of the module the course member will be able to:-

(i) obtain information about programs and packages available for his/her and other subject areas;
(ii) obtain any required programs and packages available for his/her and other subject areas;
(iii) submit packages and/or parts thereof for dissemination through the 'systems' available;
(iv) use the Micronet 800 system both as information provider and for 'down loading' programs;
(v) use the Micronet 800 system to disseminate information and programs.

Associated Software: a wide range for illustration. (see Figure 1)

19. Module 9 - Evaluation of CBL Materials

Aim: To evaluate CBL materials

Objectives: At the end of the module the course member will be able to:

(i) list criteria to be used to assess program/package suitability;
(ii) list criteria to be used to assess program/package quality;
(iii) assess a particular program/package according to criteria outlined in (i) and (ii) above.

Associated Software: selection from the available range. (see Figure 1)

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20. Module 10 - managing the CBL innovation

Aim: To familiarise the course member with the management of CBL innovations.

Objectives: At the end of the module the course member will be able to:-

(i) state reasons for using computers in FE;
(ii) illustrate the need for senior management to discriminate between CBL and other computer related activities requiring resources;
(iii) indicate the need for senior management to decide on an institutional level of involvement in and support for CBL;
(iv) propose and describe support structures necessary for using computers in FE;
(v) initiate an analysis of a particular institute's needs for staff development related to computers.

Package Contents

21. The package contains the Manager's Guide and the ten modules comprising:-

(i) lesson plans;
(ii) presenter's notes;
(iii) course members notes (handouts);
(iv) masters for overhead projector transparancies (Viewfoils);
(v) courseware (software plus notes), relevant applications of CBL;
(vi) assessment tests where appropriate;
(vii) references to recommend courseware readily available - eg video tapes, texts, software.

22. The ten modules can roughly be divided into two sections:

(i) Computer Literacy which presents a quick guide to setting up the equipment and a brief description of what computers can and cannot do. (Modules 1,2,3,5 and 8).
(ii) Computer Based Learning which familiarises the user with CBL; what it is, why, where and how it can be used and what are the best

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ways of introducing it to students and to the institution. CBL is shown to comprise computer assisted learning (CAL), computer managed learning (CML) and computer assisted administration of courses (CAA).

Relationship with Exemplars

23. The structural division of CBL into CAL, CML and CAA made it imperative that exemplars of each be included within the package. Fortunately the curriculum development packages covered such diverse aspects of CBL that they readily matched the overall pattern. This is shown diagrammatically in Figure 1.

24. From the conspectus in Figure 1, it appears that the overall project is weighted towards CAL. This apparent bias is easily explained. In CML and CAA the programs are, in the main, content free. Packages produced to analyse test-data for example, can be used in any subject area and it is sufficient to show two packages using similar, almost the same, programs to do completely different functions in two very diverse areas.

It is hoped that FE teachers will recognise the potential of such CML programs and adapt them for use in subjects and courses other than mining engineering and food science.

25. Again in CAA, programs are often content-free and much hardware and software is being developed to produce visual aids, handouts, etc. However, the Business Studies package is quite specific in its application for producing business data and is an exemplar of CAA. This particular package is too comprehensive to be included as part of a two hour staff development module.

Suggested Methods of Using the Pack

26. It is envisaged that successful implementation of the pack will be most likely to take place if the college management support the innovation. With this in mind the Manager's Guide - particularly the summary which gives people the gist of the pack without having to read it all - is aimed at the Principal/Vice-Principal of the establishment.

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FIGURE 1

RELATIONSHIP OF SOFTWARE TO STAFF DEVELOPMENT PACK

Related Software	1 Rationale	2 Functions/Limitations	3 Computer features	4 Computer-Assisted Learning	5 CAL production	6 Computer-Managed Learning	7 Computer-Assisted Administration	8 Curriculum development	9 CBL evaluation	10 Management of CBL
Welcome	x							x	x	
Tree of Knowledge		x						x	x	
Vehicle Repair		x						x	x	
Keyboard			x					x	x	
Processing Simulation			x					x	x	
CAL Construction*				x				x	x	
CAL Biology*				x				x	x	
Theodolite Simulation*				x				x	x	
Motor Vehicle Simulation*				x				x	x	
Drawing a picture					x			x	x	
CML - Guggenheim and Lazenby						x		x	x	
CML Catering Science*						x		x	x	
CML Engineering						x		x	x	
CAA Business Studies*							x	x	x	
Careers							x	x	x	
Wordwise							x			

* Software produced by the project
All software is either available commercially or written by project members.
NOTE: Users are reminded that most software is subject to copyright

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27. Throughout, it is presumed that the manager is someone delegated by the Principal, or his representative, to run the course. This manager may or may not be the presenter of the package or module. The temptation when seeing the word computer on any document is to hand it over to the computing expert within the establishment. However, because of the package design which provides a very brief and shallow explanation of what a computer is and what it can do, the temptation to expand and elaborate on this section (to the detriment of the important part of the pack) is strong and a warning to this effect is given.

28. The pack has been designed to be used either as a complete course of ten two-hour sessions or on a piecemeal basis, and it can have a variety of applications. The application appropriate for any particular institution depends on many factors, not least of which is time, and every contingency cannot be catered for here. However, some possible situations and suggested approaches are given here for guidance.

Variations of the above selected methods of use show the flexibility of the package as instructional material. Moreover the package may be further used as an information provider. Module 8, which needs to be continually updated and amended, provides the sources and methods of obtaining information regarding programs and packages, and gives details of how to obtain them. Its versatility should be one of its strengths.

29. The package has been designed to provide flexibility for those responsible for staff development. It could usefully be applied in the following situations:

(i) in-house staff development courses organised on a college, LEA or regional basis,
(ii) initial teacher training courses as part of the core studies;
(iii) RSA Teachers' Certificate for Computer Education courses;
(iv) RSA Teachers' Certificate for the use of Computers in Education;
(v) for individual study on an open learning basis.

30. Whilst the package was not specifically designed as a computer awareness course for FE teachers, those undertaking the programme will have enhanced their awareness of computing and related new technology. The

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first three units introduce the necessary basis for further practical work in CBL and being at an 'awareness' level they may also form a useful contribution to a staff awareness programme.

31. Where course members are teachers or students in teacher education departments, Module 5 takes on a most significant role. It may prove profitable to use this module as a means of introducing CBL into the education course by relating the principles of learning to the production of instructional materials (including CAL) and the Gagné' model of learning as information processing instead of the office analogy for CAL suggested in Module 3. Gagné' uses the computer process as an analogy of the learning process; revising the analogy may serve to strengthen both concepts.

32. Combining the Manager's Guide, presenter's notes and handouts (including masters of OHPs), the package can be disseminated as Open Learning materials. However, as a presenter of the package needs to be computer literate, there is a similar need for qualified tutors to be available in the open learning situations.

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SECTION II: THE CURRICULUM EXEMPLARS: SEVEN PACKAGES

Introduction

33. This section describes the curriculum exemplars developed within the project by subject specialists who collaborated to devise, test and refine the software and course support materials (see Appendix B). The need for these materials was identified early in the life of the project; the process of peer-reviews they have undergone testifies to their validity.

34. The conspectus (Figure 1) shows how these packages can be integrated into the staff development course. The packages are however free standing and are being made available as such*.

35. Each entry in this section gives where appropriate the package aim, contents, target population, learning objectives and technical data - a format welcomed by lecturers in further education when used in Micro-computer materials for MEP (FEU, 1984).

Biological CAL Package

36. AIMS

The package has been designed to utilise the capabilites of current micro-computers in respect of interaction, random number generation and graphical animation, to assist on a wide range of FE courses. In particular the package seeks to assist in the understanding of:

(i) the manner in which random particle motion leads to transport by diffusion;
(ii) how temperature and pressure affect the process of diffusion.
(iii) the principle of osmosis;
(iv) the principle of selective active transport across a cell membrane;

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(v) the basis for osmotic changes in cells when immersed in solutions of varying concentration.

37. CONTENTS

The package comprises two programs with supporting documentation for use on either a BBC model B or an Apple II micro-computer. The first program simulates the processes of diffusion, osmosis and active transport, whilst the second program applies the principles of osmosis to blood cells and plant cells. Both will run on micro-computer configurations with cassette tape or disk as the primary means of loading programs. The documentation comprises the following:

(i) a set of notes for the guidance of lecturers in loading and operating the programs, and using the package in a teaching/learning situation;

(ii) an A5 size students' instruction booklet for the program on cell transport mechanisms, designed to encourage the students to use the program in a way that will achieve the learning objectives;

(iii) accompanying worksheets for use with ii);

(iv) an A5 size students' instruction booklet for the program which applies osmosis to cells;

(v) accompanying worksheets for use with iv).

38. TARGET POPULATION

The materials are designed to assist in the teaching/learning of cell transport mechanisms for students taking Biology units included in Science, Food Technology, Health, Medical technician or other similar BTEC schemes. The package is also applicable to students involved in GCE courses at 'O' or 'A' level in Biology or Human Biology.

39. LEARNING OBJECTIVES

The package has been designed so that by working through the programs, students will be able to:

(i) select the appropriate simulation (eg diffusion, osmosis or active transport);

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(ii) specify and select time periods for simulated activity;

(iii) record observations in tabular form;

(iv) compute average values;

(v) present results in graphical form;

(vi) interpret results;

(vii) test hypotheses

40. TECHNICAL DATA

	BBC MODEL B	APPLE II
DISK/CASSETTE	Disk or Cassette	Disk
MEMORY SIZE	32K	32K
BASIC VERSION	BBC	Applesoft
OPERATING SYSTEM	1.2	3.3 DOS
HIGH RESOLUTION	YES	YES
COLOUR	YES	YES

Software available from:
PAVIC PRODUCTIONS, Sheffield City Polytechnic, 37 Broomgrove Road, Sheffield, S10 2BP

Business Studies Package

AIMS

Two software packages are provided to support lecturers as indicated in paragraphs 41 and 42.

41. 'BUSINESS DATA PRODUCTION'

(i) to assist in the realistic use of commercial integrated accounting and stock control programs

(ii) to maintain two files relating to the trading activities of an imaginary company which will 'use' the accounting and stock control programs.

(iii) to produce purchase orders from (or invoices to) the external companies.

(iv) to facilitate the generation of numerous files such that a College, using this package, may 'trade' as different companies each with its own product lines and range of customers.

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(v) to optionally send a copy of the printed material to a disk file which would then be available to the 'Key to Disk' package outlined in para. 43.

42. 'KEY TO DISK'

(i) to assist with the training of data entry operators by facilitating the keyboard entry of large quantities of data and then checking for speed and accuracy;

(ii) to accept, as input data, the information keyed in from a batch of paper output from the Business Data package and to file this data under a student's name;

(iii) to report the number of key strokes made during the data entry session including deletions and re-entries;

(iv) to compare the keyed in data with the original data as generated and stored by the data question program [para 41(v)] and to report the number and type of errors.

43. CONTENTS

This package contains:-

(i) one program disk (two for 380Z systems) containing the two master programs MAINTAIN and DOCUGEN. MAINTAIN performs the maintenance of the two files outlined in 138 (ii) and DOCUGEN produces the purchase orders, invoices or payments;

(ii) a data disk containing the system information data file as well as the data and index files (PRODUCTS, CUSTOMERS, PAYMENTS and MARKS);

(iii) one manual which outlines how to use the business data production package;

(iv) a further program disk containing the 'Key to Disc' software. These programs use the same data disk;

(v) manual for the 'Key to Disc' software.

44. TARGET POPULATION

The packages have been designed for use with a wide variety of students following business related courses, in particular:

BTEC Business Studies Diploma and Certificate course

RSA Office Practice.

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45. TECHNICAL DATA

The data generation programs require a CP/M based micro-computer to prepare the materials. However, it is not necessary to run the business packages on a CP/M machine. Once the paper output has been produced it may be used with any package on any machine e.g. PET, APPLE, BBC. The output may also be used in manual systems if the teacher so wishes! A version for 16 bit machines is being developed.

	RML 380Z	OTHER CP/M
DISK/CASSETTE	5.25" Dual Disks Double Density	5.25" Dual Disks
MEMORY SIZE	56K	56K
BASIC VERSION		
OPERATING SYSTEM	COS 3.4	CP/M (including 1.4)
HIGH RESOLUTION	NO	NO
COLOUR	NO	NO
PRINTER	YES	YES

Software available from:
PAVIC PRODUCTIONS, Sheffield City Polytechnic, 37 Broomgrove Road, Sheffield, S10 2BP

Catering Science CML Package

46. AIMS AND LEARNING OBJECTIVES

CML enables the lecturer to manage the learning situation more efficiently and use time more effectively. This package applies 'content-free' software to support general science teaching. The objectives of the package can be divided into two groups:

For the lecturer:

(i) to analyse student performance and identify individual weaknesses;
(ii) to provide more effective remedial work for weaker students on an individual basis;

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(iii) to analyse the effectiveness of phase tests and thus produce tests that are reliable;

For the student:

(iv) to identify clearly the areas of study not understood;

(v) to work independently of the lecturer using practice and remedial material in areas of weakness.

47. CONTENTS

The package consists of five components:

(i) instruction manual giving detailed instructions to enable staff with little or no knowledge of micro-computers to use the materials;

(ii) a 5.25" floppy disk carrying the program and remedial file;

(iii) set of remedial worksheets and revision sheets;

(iv) bank of 222 objective questions on Chemistry, Physics, Biology, Cleaning science, Commodities and Microbiology;

(v) list of reference books.

48. TARGET POPULATION

The package has been designed for use in conjunction with the General Science level 1 unit, which is part of the BTEC Diploma in Hotel Catering and Institutional Operations Management as submitted by the Yorkshire and Humberside consortium of colleges. However, it could be used for a number of other courses which have a similar science content - eg other BTEC catering courses, CGLI catering programmes and CGLI and BTEC home economics courses.

49. The package provides remedial work for students in areas in which weaknesses have been identified from phase tests, thus improving the students' chance of success in a subsequent resit. More able students can also benefit from the improved feedback from phase tests that will be obtained by using this package, extended where appropriate with lecturers' own items.

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50. TECHNICAL DATA

	BBC MODEL B	RML 380Z
DISK/CASSETTE	5.25" Dual Disks 80 Track	5.25" Dual Double Sided Disks
MEMORY SIZE	32K	56K
BASIC VERSION	BBC	V5.0
OPERATING SYSTEM	1.2	COS 3.4
HIGH RESOLUTION	NO	NO
COLOUR	Preferred	NO
PRINTER	YES	YES

Software available from:
PAVIC PRODUCTIONS, Sheffield City Polytechnic, 37 Broomgrove Road, Sheffield S10 2BP

Construction Technology CAL Package

AIMS

51. The aim of the package is to demonstrate a variety of ways in which computer assisted learning techniques can be applied to topics in Construction Technology. The programs are primarily seen as support materials for Module 4 of the Staff Development package; however each program may be used with individuals or groups of students that match the design target populations.

52. CONTENTS

The package consists of two computer programs together with staff notes and student worksheets for each program:

(i) Program 1 - to demonstrate the use of the steel square and the procedures for obtaining levels for a hipped roof;
(ii) Program 2 - to demonstrate the factors and calculations necessary to determine the correct size of eaves gutters.

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53. TARGET POPULATION

(i) The steel square in roofing program is aimed at students studying the CGLI syllabus 585, Advanced Craft Certificate in Carpentry & Joinery.

(ii) The sizing of eaves gutters program has been designed for students studying the CGLI syllabus 596-2, the Advanced Craft Certificate in Plumbing.

54. LEARNING OBJECTIVES

(i) Use of steel square

The student will be able to:

(a) observe the methods of obtaining the required bevels for a traditional hipped roof;

(b) record the procedure for obtaining the required lengths to set up the bevels;

(c) determine the lengths of the bevels;

(d) mark off lengths and angles and show positions of the steel square on worksheets.

(ii) Sizing of eaves gutters

The students will be able to:

(a) identify the factors affecting run-off rates;

(b) identify the factors that determine the design of gutter size;

(c) calculate the run-off from a sloping roof;

(d) state the effect of gutter and downpipe positions;

(e) state the effect of a bend in the gutter;

(f) use flow tables.

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55. TECHNICAL DATA

	RML 380Z	RML LINK	BBC MODEL B*
DISK/CASSETTE	5.25 Disk	5.25. Disk	5.25" Disk
MEMORY SIZE	47K	47K	32K
BASIC VERSION	G/G1/G2	480Z	BBC
OPERATING SYSTEM	COS 3.4 (or later)	CP/M network	1.2
HIGH RESOLUTION	YES	YES	YES
COLOUR	YES	YES	YES

* Program 1 only

Software available from:

PAVIC PRODUCTIONS, Sheffield City Polytechnic, 37 Broomgrove Road, Sheffield, S10 2BP

Engineering Science Package

56. AIMS

In-course assessment and, in particular, periodic phase testing has become an integral part of the assessment pattern of BTEC units. The results from any assessment should provide both the teacher and the student with information about their performance. The aim of the package is to use a micro-computer to assist in supplying this information.

57. CONTENTS

Materials have been produced for two BTEC units: the materials for each unit comprise:

(i) phase tests;
(ii) students answer sheets for phase tests;
(iii) marking schemes for phase tests;
(iv) disk containing programs and remedial test data files;
(v) instructions for the use of the programs;
(vi) handout/remedial notes for tests not adequately covered by the textbook.

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58. TARGET POPULATION

The package, which is in two parts, was designed for students preparing for:

(i) BTEC Engineering Principles I (U82/046)
(ii) BTEC Engineering Science II (U80/734)

Some of the individual tests should also be suitable for units in other BTEC programmes.

59. TECHNICAL DATA

	BBC MODEL B	RML 380Z
DISK/CASSETTE	5.25" Double sided disk	5.25" Twin double sided disks
MEMORY SIZE	32K	47K
BASIC VERSION	BBC	V5.0
OPERATING SYSTEM	1.2	COS 3.4
HIGH RESOLUTION	NO	NO
COLOUR	Preferred	NO
PRINTER	YES	YES

Software available from:
PAVIC PRODUCTIONS, Sheffield City Polytechnic, 37 Broomgrove Road, Sheffield, S10 2BP
Text books available from Stanley Thornes (Publishers) Ltd

Motor Vehicle Simulations Package

60. AIMS

The package is intended for use by motor vehicle engineering staff and students in colleges of FE where there is a need for a teaching aid particularly at craft level. The materials have been designed so that they can be used in the following ways:-

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(i) To demonstrate some aspects of motor vehicle engineering in the classroom as an enhancement to setting up testing equipment in the workshop;

(ii) To enable an individual or small group of students to reinforce the knowledge acquired during formal teaching situations and in the workshop.

61. CONTENTS

The package consists of three elements:-

(i) staff notes on setting up and using the package;

(ii) student notes and worksheets for use during the running of the computer programs;

(iii) a floppy disk containing the suite of programs.

62. TARGET POPULATION

The package is designed specifically for motor vehicle craft students at CGLI Level II and Level III, although some of the facilities of the programs would be appropriate for students at other levels of study. Because of its modular nature, individual parts of the program may be used independently without having to run the whole program.

63. LEARNING OBJECTIVES

The package has been designed so that students will be able to:

(i) identify potential faults in components using diagrams of systems in a typical vehicle (electrical, ignition, fuel, engine, exhaust gases);

(ii) state the symptoms/checks associated with the faults in (i);

(iii) compare expected and observed results for exhaust gases graphically.

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64. TECHNICAL DATA

	BBC MODEL B
DISK/CASSETTE	Disk
MEMORY SIZE	32K
BASIC VERSION	BBC
OPERATING SYSTEM	1.2
HIGH RESOLUTION	YES
COLOUR	YES

Software available from:
PAVIC PRODUCTIONS, Sheffield City Polytechnic, 37 Broomgrove Road, Sheffield, S10 2BP

Theodolite "Simulation" Package

65. AIMS

The package is intended to assist in the teaching of the principles of basic Trigonometry and elementary Surveying. It may be used by the student as a learning aid, or by the lecturer as a teaching aid. The particular application is at the discretion of the teacher, and should relate to the needs and abilities of the students, and to the learning outcomes required. The main aims are:-

(i) to relate concepts encountered in theoretical work to practical applications;
(ii) to provide reinforcement of principles and ideas through practical work within the classroom;
(iii) to enable the lecturer to illustrate the concepts of angle, bearing, elevation, etc. in a simple practical way;
(iv) to demonstrate that the computer may be used as a practical monitoring and display device;
(v) to stimulate discussion concerning the requirements of angle measuring devices in terms of accuracy and resolution.

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66. CONTENTS

The package contains four elements:

(i) teachers notes on the operation and setting up of the instrument;
(ii) students guide and worksheets;
(iii) computer program;
(iv) low cost model theodolite.

67. TARGET POPULATION

The package has been designed for use by students enrolled on BTEC Construction courses which contain elements of Trigonometry or Surveying. Also, there are a number of basic mathematics courses in FE in which elements of Trigonometry are taught, and it is hoped that the package will be of use in teaching such elements.

Because of the general nature of the topics, a considerable amount of interest has been shown by teachers and advisers in secondary education, and the package may be modified for use in that area.

68. LEARNING OBJECTIVES

The package has been designed so that the student using the equipment to simulate sitework, will be able to:

(i) develop concepts of angle, co-ordinates and intersection of two lines of sight;
(ii) take bearings onto targets;
(iii) determine bearings from a computer display and produce drawings to scale using a protractor and scale rule;
(iv) determine length of offsets from baseline;
(v) determine height from datum level;
(vi) determine plan area of survey.

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69. TECHNICAL DATA

BBC MODEL B

DISK/CASSETTE	Disk or Cassette
MEMORY SIZE	32K
BASIC VERSION	BBC
OPERATING SYSTEM	1.2
HIGH RESOLUTION	YES
COLOUR	Preferred
OTHER HARDWARE	Model Theodolite

Software and model theodolite available from:
PAVIC PRODUCTIONS, Sheffield City Polytechnic, 37 Broomgrove Road, Sheffield, S10 2BP

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SECTION III DEVELOPMENT OF THE PROJECT: THE MODEL

Background

70. The initial idea for the project arose from a three day regional residential conference held in January 1980 which attracted 35 participants of whom 22 had senior management responsibilities in FE. The positive, forward-looking views expressed and the enthusiasm generated during the conference, persuaded the course director to produce a conference report for circulation within the region.

71. The report identified a range of problems for colleges in the areas of computer hardware, software, staff development and curriculum development. Recommended solutions included:

(i) Initial teacher training. Familiarisation with and the applications of micro-computers should be part of the common core curriculum for all pre-service and in-service teachers.

(ii) College management. The responsibility for introducing micro-computers and developing their applications lies firmly with the college principal and his senior colleagues. They must be prepared to find resources to purchase the appropriate hardware and encourage the development of software by remission of duties.

(iii) Staff development. Identified as the most significant problem; both teaching and non-teaching staff must be involved to some extent, although the level of involvement and expertise required varies considerably. It is necessary to consider which elements of staff development could be tackled on a college basis and which required the greater resources available on a LEA, regional or national basis.

72. The need for regional and national involvement in staff development was emphasised in the report. Of possible activities that could be co-ordinated on a wider scale the following were suggested:

(i) a regional/national survey to determine the state of progress and to identify inter-regional co-operation in the development of learning materials to be used with micro-computers;

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(ii) co-ordination of curriculum working parties for specialist subject teachers;

(iii) co-ordination of staff development courses within the region;

(iv) formation of a bank of learning materials and micro-computer software;

(v) distribution of up-to-date information regarding developments in the region and elsewhere;

(vi) support for the proposal that computer appreciation should be included in all initial teacher training courses.

73. The report was considered by the YHCFE Regional Consortium for FE Teacher Training and Staff Development, and in September 1980 it resolved "that the report...be referred to the Committee for Staff Development in order that it might initiate corresponding regional activity". Two months later a working party was established to "report on the teaching and learning applications of micro-computers and to establish priorities for staff development".

74. In the spring term of 1981, the working party conducted a survey of all the FE institutions in the Yorkshire & Humberside region to try to determine the current state of progress of micro-computing. The survey identified the range and quantity of hardware in the region's colleges and elucidated those departments that were already using the equipment. It also indicated those LEAs that had established policies which imposed limitations on colleges as to the type of equipment that could be purchased. Perhaps the most important findings of the survey were the uses to which micro-computers were being put and also the longer term aspirations of departments for when sufficient hardware would become generally available. Many of the critical observations contained in the report were identified as still relevant in 1984 in an FEU survey of IT policy and of current practice in a sample of colleges.*

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* Information Technology in further education FEU (1984).

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75. The members of the working party, with the support of officers of YHAFHE and FEU, prepared a submission which ultimately led to the approval of the two year project, sponsored by FEU, that commenced in January 1982.

The Project Aims

76. (i) The original aims of the project, as stated in the Information Bulletin were:-

(a) to produce guidelines and related materials for the training and preparation of FE teachers in using, evaluating and adapting computer programs relevant to their subjects and level of teaching;

(b) to implement and evaluate the guidelines and related materials with a view to future development.

(ii) As the project developed and became more ambitious, objectives were agreed that incorporated the original aims:-

(a) to produce a comprehensive model for the implementation of a staff development programme at college and regional level;

(b) to identify micro-computer programs for computer based learning that had been developed recently within the region;

(c) to produce associated subject matter and materials to be used with the identified computer programs within the context of non-advanced FE.

77. The methods adopted to achieve these aims were:

(i) The appointment of a steering committee by YHAFHE to have immediate responsibility for the project. Its initial membership to include the chairman and nominated members of the regional staff development committee, the project director, the regional staff development officer, representatives of FEU and MEP and invited specialists in the field of micro-computing. The Chief officers of YHAFHE to act as secretary to the steering committee.

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(ii) the identification and appointment of a suitable person to act as team leader for the staff development package;

(iii) the identification and appointment of suitable team leaders to produce computer programs and associated materials for use by teachers of main stream FE subjects at non-advanced levels;

(iv) the establishment of groups of subject specialists to work with team leaders and to ensure the validity of the subject matter content within the developed programs;

(v) the production of guidelines and criteria for the preparation of the staff development package and the curriculum programs and other developed materials;

(vi) the project director to have an executive reponsibility to co-ordinate the various aspects of the project and to provide advice when necessary to the team leaders.

78. The steering committee, whose membership is given in Appendix A, met regularly throughout the two years of the project. As the project developed into a truly regional exercise with team leaders based in eight different colleges and team members drawn from many other colleges, the role of the steering committee became more significant, not only in determining policy, but in supporting the project director. All team leaders were co-opted to the steering committee, as was a consultant for two of the project teams.

79. All of the colleges in the region were invited to participate in the project; in the first instance by providing a team leader with viable ideas for a CBL package, and subsequently by allowing specialist subject teachers to become members of one of the teams. At this stage no overall direction was given and most submissions were made on a free standing basis rather than as support materials for a staff development package.

80. The steering committee considered 20 separate applications for curriculum exemplars from thirteen different colleges. Initially, six schemes were accepted, with a seventh approved at a later date.

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81. The project secretary wrote to the principals of the colleges that had been successful in being accepted for the project, inviting the college to confirm "the obligation of participating institutions to match the external funding with a significant degree of internal resource allocation". A positive response was received from all of the colleges.

82. The project was given its official launch at a conference held in February 1982. Every college in the Yorkshire and Humberside region had received information concerning the project and had been invited to send representatives to the conference. The response was encouraging with over 120 teachers attending. The conference was a success in many respects. It attracted representatives from nearly every college in the region and therefore provided a basis for a communications network for the dissemination of project information.

83. Mainly as a result of the conference, over 100 lecturers volunteered to become involved with the project as team members. A large group of staff-tutors and subject-specialists chose the staff development model and the biology and business data production teams attracted healthy support. Catering science and the control technology team leaders had sufficient support initially but the team leaders for the construction technology and engineering science exemplars experienced a lack of interest and even hostility from some of the specialist teachers in these areas. Figure (2) shows a regional map with the distribution of project participants.

84. Target dates for the project were set in January 1982 as follows:

Membership of approved sub-projects finalised	- February 1982.
Detailed programme of work submitted by each team leader to Steering committee	- March 1982.
Team progress reports to Project Director	- December 1982.
Interim report to FEU	- January 1983.
Initial development work completed	- January 1983.
Field trials	- February/October 1983.
Team final reports to Project Director	- December 1983.
Final report to FEU	- January 1984.

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YORKSHIRE AND HUMBERSIDE REGIONAL MAP

FIGURE 2

85. Standards for computer programs and documentation were adopted from two papers presented at an MEP Regional Directors' Conference at Tynemouth in 1982. It was agreed that all computer programs developed by the project would run on at least two of the then most popular machines that had been identified in the region (the Pet, Apple II and the RML 380Z.)

Coordination and Collaboration

86. The project director had the task of co-ordinating the many and varied activities of the eight development teams and at the same time of stimulating, encouraging and supporting the team leaders to achieve the ambitious targets that had been agreed. The support took several forms:-

(i) attendance at the first meeting of each team and occasional attendance at subsequent meetings;

(ii) setting intermediate targets for sections of the programs;

(iii) previewing and commenting on early editions of the packages;

(iv) regular discussions, or correspondence, with team leaders.

87. As the project progressed, the volume of material generated by the teams increased and the project director was grateful for the valuable assistance given by the steering committee chairman so that a proper overview of the project could be maintained. Reports were prepared regularly for consideration by the steering committee and the FEU.

88. In general terms, the members of the staff development team each selected a module and prepared all of the teaching and learning materials prior to their editing by the full group. The curriculum teams tended to meet more frequently with individual team members submitting material to the team leader to build into a computer program.

89. The regular meetings and vigorous activities of the teams in the early days of the project during the spring and summer terms of 1982, produced two significant outcomes. Firstly, some of the aims and objectives which had originally been proposed by the team leaders were modified in the light of discussions with the subject specialists. Secondly, for a variety of reasons, some of the volunteer team members decided to drop out of the project. The reasons for withdrawing from the project included heavy workload at college, difficulty in attending team meetings particularly if the member had to travel a long distance, promotion or

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new appointment, early retirement, lack of support from the parent college and waning interest on the part of the member.

90. A major change of direction occurred with the 'control' package. At the first team meeting, prospective team members identified a range of possible topics for development but only the team leader had any in-depth experience of electronics and of interfacing laboratory equipment to micro-computers. The team leader encouraged two members to pursue a topic each with his support, whilst he chose to develop a personal idea of a theodolite simulation for use with construction students. The theodolite proved to be a most original exemplar and was well received during the field trials. The other two topics were not completed in time for inclusion with the final package.

91. The protection of copyright of the materials being developed had to be stressed. Some of the packages had proved attractive to certain external agents who then made overtures to team leaders for a copy of the program. The steering committee issued strict instructions regarding security of materials, particularly computer programs on disk or tape.

92. Four of the team leaders - Biology, Construction Technology, Theodolite Simulation and Business Studies - were nominated by the steering committee to present their materials at a convocation of the Centre for Industrial and Education Liaison for West and North Yorkshire (CIEL) in November 1982. The many enthusiastic visitors who attended the presentation kept the team leaders fully occupied with questions which proved helpful for the next stage of the project.

93. A project open day at Woolley Hall College in December 1982 had the desired effect of exposing the staff development and curriculum packages to a wider audience and eliciting helpful and constructive criticism. The exercise helped to accelerate the final touches to the materials so that the products were ready for field testing within the original time schedule. Further, of the college representatives who attended the open day, many offered to participate in the field testing during the spring and summer terms of 1983.

94. The open day identified a need for bringing all of the team leaders together. The curriculum team leaders gave a presentation of their

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packages to the members of the staff development team at the offices of YHAFHE in February 1983. The object of the day was to enable the staff development members to identify the relationship between the ten units of the main package with the seven exemplars (see Figure 1).

Field Testing

95. Each team leader was asked to prepare proposals for the evaluation phase of the project. These had to include:-

(i) a clear indication of the objectives of the field testing;
(ii) a clear statement of the materials to be released for field testing;
(iii) a description of the testing methods to be used;
(iv) an indication of the follow-up procedures to be adopted;
(v) a list of the individuals and institutions who would be participating in the field trials.

The project director and the steering committee chairman were charged with the task of examining the proposals and approving the arrangements.

96. The staff development package was subjected to rigorous scrutiny by an invited audience of teacher trainers and college staff tutors at Bramley Grange College. This preceeded some informal evaluation of the modules by staff of the Faculty of Education, Huddersfield Polytechnic and formal field testing by volunteer staff tutors with volunteer course members from Leeds LEA.

97. Most of the team leaders experienced problems with hardware during the field testing. In some instances difficulties had been created by the field testers' lack of understanding of the equipment, but in most cases the problem was different versions of the same make of micro-computer. For the BBC Model B micro-computers, it became necessary to issue a 40-track and an 80-track disk version of the programs. For the Research Machines 380Z micro-computer the problems tended to be more serious; many machines were early versions that had not been upgraded and therefore programs requiring high resolution colour graphics or 80-column displays would not run.

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98. A major problem arose when the only Apple II in Bradford College was stolen in June 1983. All staff development materials were stored on disk (the team leader had laboriously typed in every word) which, without the machine, was useless. The hard lesson learnt was to use a word-processing package on machines commonly in use in the college!

99. A major alteration, and delay to the schedule, occured after the presentation to prospective field testers in April 1983. At this presentaton 35mm slides were used. Their quality was excellent but the course members considered that overhead projector viewfoils were more appropriate. The reasons given for the change were very sound and readily acceptable. With viewfoils there was no need for a darkened room; staff were more familiar with using the OHP; OHPs were more readily available; dissemination of master viewfoils would be easier and cheaper. This change was adopted (see para 21).

100. Undoubtedly the greatest criticism of the staff development package was the volume of materials within each module. This is accepted but it is argued that it is better to err on the side of too much rather than too little. The Manager's Guide takes this into account and suggestions are made regarding selection of materials under various conditions.

101. The observations of the module field testers who were not computer specialists included:-

(i) the preparation time needed for a module was well in excess of five hours;

(ii) the multi-choice tests, though easy to administer, were too negative and too intimidating.

The first reaction of the team to (ii) was to omit the tests altogether. However, presenters of Module 6 (CML) claimed that the 'poor' questions were identified by the computer (even with small samples). The reaction of the course members that some questions were 'poor' were confirmed by the test analysis.

All presenters reported they enjoyed giving the modules and all course members reported favourably on their learning experiences.

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102. All of the packages within the project benefitted from the field testing exercise. Screen displays were improved and documentation and worksheets were revised. Wherever possible a BBC Model B version was produced for the exemplars. (This was not thought appropriate for the Business Studies programs which were designed for any CP/M micro-computer including the RML 380Z.)

Resource Implications within Colleges

The process of staff development envisaged in this project depends on foresight and commitment by college management. At the institutional level, the implementation of the staff development package entails organising time and facilities as set out below.

The following advice relates to the staff development package when used in a relatively formal teaching setting with a group of up to 16 course members.

103. If the staff development model is to be used as a set course with formal presentations, it is strongly recommended that at least half of each session should be devoted to practical applications of CBL. Most of the developed software is available in two versions; one is for the BBC Model B micro-computer with disk drive (except the Business Studies package) and four exemplars have Research Machine 380Z versions. Colleges that have implemented the recommendations of FEU's Computer Literacy report* would be able to use the same resources, with some modest additions, for staff development. The following arrangement is suggested:-

(i) A dedicated room with a minimum of eight work-stations; each workstation comprising a BBC Model B or an RML 380Z micro computer, a colour monitor and a disk drive. Additionally, it would be necessary to have available other micro-computers in common use in the College.

(ii) Two staff to a work-station should prove satisfactory for the structured practical sessions, thus allowing up to 16 course members. Course members should be encouraged to run programs independently between the course modules. A comprehensive package

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* Computer Literacy. Part 1: A manager's guide, FEU, 1983.

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of viewfoil masters is included with the staff development model requiring that access to reprographic facilities and an overhead projector should be available in the room.

(iii) One of the staff development modules, 'curriculum development packages within FE', requires the use of the MICRONET 800 system. Micronet may be used as a viewdata information provider or for electronic dissemination of computer software. Versions of Micronet are avilable for most of the popular micro-computers including the BBC and RML 380Z, and the cost of setting up a single system would be £80 for the hard wired modem plus standing charges of approximately £50 per year.

104. In addition to the software detailed in Section II, the staff development package provides a detailed schedule of software that may be purchased at modest cost. The relationship between the software and the modules is shown in Figure 1. If course members are to be encouraged to use micro-computers to enhance their students' learning, a software library would need to be established either on a college or LEA basis. MEP Regional Centres are useful resources for software and some authorities have established software resources in teachers' centres.* The packages do not include any reference to Computer Aided Design (CAD) or Computer Aided Manufacture (CAM).** An FEU project (RP151) is developing materials for a staff development package in these areas.

105. The intended course length of the staff development package is 20 hours, if the materials are used in a traditional manner. Clearly, this has staffing implications for the college in terms of the presenters and the course members. Large colleges may be able to arrange to run the courses independently; smaller ones may need to collaborate with other colleges on an LEA or regional basis. The following situations are suggested to accommodate the full course:-

(i) one afternoon per week for ten weeks;

(ii) residential weekend - Friday evening to Sunday evening;

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* DES Circular 6/84 Education Support Grants indicates that FEU will hold a deposit of all software generated by funded projects from 1985/6.

** But see Computer Aided Design in FE FEU 1982.

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(iii) one evening per week for ten weeks;
(iv) twenty hours within an administration week.

106. If computer specialist staff are available, it may be an advantage but not essential if they were responsible for presenting the first three modules of the staff development model. However, it is strongly recommended that a non-computer specialist, who is computer literate, with proven teaching skills with adults, such as a staff tutor, be responsible for Modules 4 to 9. If the course is college-based, Module 10 'Managing the CBL innovation' should be the responsibility of a member of the college management team, prefereably the principal or vice-principal.

107. Technical support for a staff development course is essential. This is to provide practical help to set up equipment and software and to be available in the event of any technical difficulties during the presentation.

108. At the end of the course, it is likely that most of the course members will be keen to apply the principles of CBL to their own teaching situations. If continued support in the form of hardware and technical expertise is not readily available, the main impact of the course will soon be dissipated and its value to the college providing the course will be diminished.

Institutional & Regional Implications

109. Throughout the two year period, the project director and team leaders were involved to some extent with most of the colleges wthin the Yorkshire and Humberside Region. Many difficulties and misunderstandings arose because institutions had not identified a policy or strategy for the introduction of IT. Specific problems that arose at the institutional level were:

(i) all computing facilities were dedicated to computer studies;
(ii) computer literacy was assumed to mean programming in BASIC;
(iii) computers bought in late 1970s had not been upgraded to take advantage of new facilities eg high resolution colour graphics;

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(iv) computers were locked away when not in use by computing specialists;

(v) some technical departments were regarded as 'non-users' by senior college staff;

(vi) a shortage of blank disks or tapes for development purposes;

(vii) a lack of support staff;

(viii) a lack of management interest and encouragement;

(ix) the unwillingness of college senior staff to allocate staff time to development.

110. At the level of project management, experience has shown that such an ambitious project needed far more financial input. Though college facilities were made available and indeed offered, immediate amendments and updates were impossible yet so necessary. Payment for a full-time secretary for the duration of the project would have ensured better and more complete results.

111. Nonetheless the experience gained by the many teachers who contributed to the production of the materials in the packages was considerable; the project proved to be an excellent staff development exercise in itself.

112. At the end of the project, the following recommendations were made to YHAFHE:-

(i) it would be proper for the region to build on the project, utilising the experience and expertise gained from it in new directions and on a broad front;

(ii) the project itself should be used as a lead-in to a concerted regional dissemination exercise designed to heighten awareness of micro-computer applications in FE and of the large amount of work that would still remains to be done;

(iii) as part of this exercise, attention would have to be given in conjunction with national initiatives, to the distribution of materials and their subsequent updating;

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(iv) the project should be used as a catalyst for promoting the development of further curriculum exemplars and packages in hitherto untouched areas, and for improving the quality and performance of materials already in existence;

(v) the project should also be used as the basis for a network of micro-computer users, involving the Yorkshire and Humberside colleges in a more broadly representative way;

(vi) provision should be made within the structure of the YHAFHE to monitor the implications of new technology for FE on an on-going basis.

113. The project materials were launched at a day conference on 22 June 1984 in Leeds. Some 300 visitors had an opportunity to sample the materials and meet members of the development teams. Programs were run on free standing micro-computers and on small networks. Downloading software using Prestel Micronet 800 was also demonstrated to show one possible method of updating and developing project materials. As indicated in Section II, arrangements have been made for a polytechnic in the region to make the materials available for purchase.

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APPENDIX A

STEERING COMMITTEE

J. Waters, Director of Computing, Bradford College (Chairman)
R. Ashford, York College of Arts and Technology
J. Blythe, Development Officer, FEU (January 1982 - June 1983)
P. Channell, Shipley College of Further Education
G. Ingle, Regional Staff Development Officer, YHAFHE (January 1982)
P. Ivey, Grimsby College of Technology
A. Hyslop, Barnsley College of Technology
P. Laxenby, Huddersfield Polytechnic
R. Leight, Regional Director, West and North Yorkshire MEP
F. Marrow, Bradford College
H. Mellow, Regional Staff Development Officer, YHAFHE
T. Mozley, Wakefield District College
P. Noble, Development Officer, FEU (From June 1983)
M. Nulty, Thomas Danby College, Leeds
P.R. Shuker, Principal, Leeds College of Building (Project Director)
R.M. Thomson, Leeds College of Building
P. Horton, YHAFHE (Secretary)

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APPENDIX B

MEMBERSHIP OF DEVELOPMENT TEAMS

STAFF DEVELOPMENT PACKAGE

F. Marrow, Bradford College (Team Leader)
K. Aldred, Huddersfield Polytechnic
R. Clague, Wakefield District College
S. Cockerill, Wakefield District College
N. Combes, Percival Whitley College, Halifax
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P. Doefler, Park Lane College, Leeds
A. Edmondson, Bradford College
R. Kay, Bradford College
U. Marrow, Park Lane College, Leeds
M. Munley, Joseph Priestley Institute, Leeds
D. Parsons, Airedale and Wharfedale College, Leeds
P. Ward, Keighley Technical College
J. Waters, Bradford College
K. Winkler, Stannington College, Sheffield

BIOLOGY CAL TEAM

P.D. Ivey, Grimsby College of Technology (Team Leader)
A. Brown, Richmond College, Sheffield
A. Child, Barnsley College of Technology
B. Donn, Humberside College of Higher Educatiou, Hull
A. Drake, Rotherham College of Arts and Technology
J. Esser, Humberside College of Higher Education, Grimsby
R.R. Smith, Stocksbridge College of Further Education, Sheffield
P. Waltham, Thomas Danby College, Leeds
J.G. Wild, Dewsbury and Batley Technical and Art College

CONSTRUCTION CAL TEAM

R. M. Thomson, Leeds College of Building (Team Leader)
E. Judkins, Leeds College of Building
K. McCraith, Leeds College of Building
B. Parkin, Hull College of Further Education

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M. Akaroyd, Bradford College
J.S. Green, Scarborough College
P. Lazenby, Huddersfield Polytechnic (Consultant)
E.A. McDonagh, Rotherham College
A.D. Spicer, Granville College, Sheffield
G. Swanney, Grimsby College
T. Wilkinson, Hull College of Further Education

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C. Bills, Barnsley College of Technology
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R.D. Morrell, Wakefield District College, Whitwood Centre
C. Robinson, Rotherham College of Arts and Technology
R. Trevor, Rother Valley College of Further Education
B.H. Walsh, Barnsley College of Technology

THEODOLITE TEAM

R. Ashford, York College of Arts and Technology (Team Leader)
N. McCleod, Scarborough Technical College

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P. Channell, Shipley College of Further Education (Team Leader)
P. Carter, Joseph Priestley Institute, Leeds
C. Cloke, Rockingham/Richmond College
J. Coggon, Rotherham College of Arts and Technology
J. Galley, Doncaster Metropolitan Institute of Higher Education
P. Simpson, Barnsley Technical College
J. Taylor, Park Lane College, Leeds

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MOTOR VEHICLE TEAM

T. Mozley, Wakefield District College (Team Leader)
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P. Makey, Stannington College, Sheffield
D, Megginson, Bradford College
E. Smith, Wakefield District College

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APPENDIX C

GLOSSARY OF TERMS

ACSET	Advisory Committee for the Supply and Education of Teachers
BTEC	Business and Technician Education Council
CAA	Computer Assisted Administration
CAL	Computer Assisted Learning
CAT	Computer Assisted Training
CBL	Computer Based Learning
CML	Computer Managed Learning
CGLI	City and Guilds of London Institute
CNAA	Council for National Academic Awards
CCDU	Career and Counselling Development Unit, Leeds University
CET	Council for Educational Technology
IT	Information Technology
MEP	Micro-electonics Education Programme
MSC	Manpower Services Commission
RSA	Royal Society of Arts
TVEI	Technical and Vocational Educational Initiative
YHAFHE	Yorkshire and Humberside Association for Further and Higher Education
YTS	Youth Training Scheme

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APPENDIX D

ACKNOWLEDGEMENTS

The project has been truly a team effort and thanks are due to the team leaders, team members and field testers.

Many colleges and individuals gave willing support to the project and the co-operation of the following is recognised and appreciated:-

Principals of colleges that participated in the project.

Mr. J. Blythe, formerly of FEU

Mr. D.B. Edwards, formerly acting secretary of YHAFHE

Mr. D. Esterson, Inspector of Computer Education, ILEA

Mr. R. Leigh, Regional Director, North and West Yorkshire MEP

Huddersfield Polytechnic - Faculty of Education

Mr. J. Tull, Director of Studies, Bramley Grange College

Miss P. Chadbourne, Principal's Secretary, Leeds College of Building.

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APPENDIX E

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Southern Regional Council for FE— Secretary: T A Connor 26 Bath Road, Reading RG1 6NT	Berks; Hants; Isle of Wight; Oxfordshire; West Sussex	Southern Regional Council	Chris Connon 0734 52120	T A Connor (R A C)
Regional Council for FE for the South West— Secretary: F S Fisher Wessex Lodge 11/13 Billetfield, Taunton Somerset TA1 3NN	Avon; Cornwall; Devon; Dorset; Glos; Isles of Scilly; Somerset; Wilts; Guernsey; Jersey	Bayside Hill Centre Bayside Hill Polapeath Road Exeter EX4 4SA	Peter Hodgson 0872 880487	J Collins (R A C)
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East Midlands Further Education Council— Secretary: R Ainscough Robins Wood House, Robins Wood Road, Apsley Notts. NG8 3NH	Derbyshire; Lincs; Leics; Northants; Notts	East Midlands FE Council	Felicity Mawdsley 0602 290391	R Ainscough (R A C)
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APPENDIX F

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a) to review and evaluate the range of existing further education curricula and programmes and to identify overlap, duplication, deficiencies and inconsistencies therein;
b) to determine priorities for action to improve the provision of further education and to make recommendations as to how such improvements can be effected;
c) to carry out studies in further education and to support investigations of and experimentation in, and the development of further education curricula and to contribute to and assist in the evaluation of initiatives in further education;
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